

Appendix L. Final quantitative ranking of 172 vital signs.

Table 1. Final quantitative ranking of 172 vital signs. The overall score is based here on a weighting of .3 for Ecological and Management significance, .2 for relevancy of the vital sign to the monitoring question, and .2 for cost and feasibility. Although ranking scores were developed for legal mandate as shown, they were not used.

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
1	What are the trends in distribution and abundance of non-native species through time?	3.43	3.46	3.44	non-native plants	3.29	3.00	4.00	3.52
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	amphibians	3.16	2.00	4.00	3.39
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	old growth forest	3.06	4.00	4.00	3.39
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	song bird communities	3.03	2.00	4.00	3.38
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	Redwood forest	2.97	4.00	4.00	3.37
2	What are status and trends in structure, function, and	3.44	3.14	3.29	riparian plant communities	2.87	2.00	4.00	3.35

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Overall vital sign score
	composition of focal communities?								
5	What are status and trends in focal species?	3.22	3.28	3.25	keystone plants (e.g. Aspen, whitebark pine)	2.97	1.00	4.00	3.34
5	What are status and trends in focal species?	3.22	3.28	3.25	keystone mammals	2.91	1.00	4.00	3.33
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	Intertidal communities	2.76	2.00	4.00	3.33
5	What are status and trends in focal species?	3.22	3.28	3.25	keystone birds	2.88	1.00	4.00	3.33
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	Ponderosa pine forest	2.70	1.00	4.00	3.32
5	What are status and trends in focal species?	3.22	3.28	3.25	keystone fish	2.81	1.00	4.00	3.31
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	fish assemblages	2.75	2.00	4.00	3.31
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	shrublands	2.63	2.00	4.00	3.30

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
6	What are status and trends in surface waters?	3.26	3.07	3.16	surface water temperature	3.00	4.00	4.00	3.30
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	human visitation levels	2.97	2.00	4.00	3.28
10	How are connectivity, fragmentation, and level of park "insularity" changing with land use change in and around the parks?	3.20	3.00	3.10	land cover	3.12	3.00	4.00	3.28
6	What are status and trends in surface waters?	3.26	3.07	3.16	surface water contaminants	2.92	4.00	4.00	3.28
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	land birds	2.59	2.00	4.00	3.28
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	water birds	2.59	2.00	4.00	3.28
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	pollutants (organic, including hydrocarbon fuel, oil)	2.96	4.00	4.00	3.28
6	What are status and trends in	3.26	3.07	3.16	surface water flow	2.88	3.00	4.00	3.27

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
	surface waters?								
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	marine mammals	2.57	4.00	4.00	3.27
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	terrestrial vehicle traffic	2.91	2.00	4.00	3.27
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	estuarine aquatic plants	2.48	2.00	4.00	3.27
6	What are status and trends in surface waters?	3.26	3.07	3.16	surface water chemistry	2.85	4.00	4.00	3.27
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	freshwater plants	2.46	2.00	4.00	3.27
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	land mammals	2.52	2.00	4.00	3.26
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	pollutants inorganic	2.88	4.00	4.00	3.26
8	What are	3.03	3.28	3.15	foot	2.82	1.00	4.00	3.25

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
	status and trends in human impacts near sensitive plant and animal populations and habitats?				trampling evidence				
11	What are the long term trends in the predominant habitat types?	3.18	2.89	3.04	cover of habitat types	3.15	1.00	4.00	3.25
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	Second growth forest	2.38	2.00	4.00	3.25
10	How are connectivity, fragmentation, and level of park "insularity" changing with land use change in and around the parks?	3.20	3.00	3.10	land use (in and around park)	2.94	3.00	4.00	3.25
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	tide pool condition	2.76	2.00	4.00	3.24
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	Native grasses	2.41	2.00	4.00	3.24
1	What are the trends in distribution and	3.43	3.46	3.44	non-native vertebrates	2.85	3.00	3.00	3.24

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Overall vital sign score
	abundance of non-native species through time?								
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	coliform bacteria	2.75	4.00	4.00	3.24
10	How are connectivity, fragmentation, and level of park "insularity" changing with land use change in and around the parks?	3.20	3.00	3.10	road density	2.85	2.00	4.00	3.23
10	How are connectivity, fragmentation, and level of park "insularity" changing with land use change in and around the parks?	3.20	3.00	3.10	landscape pattern	2.85	2.00	4.00	3.23
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	reptiles	2.34	2.00	4.00	3.23
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	early successional communities	2.26	2.00	4.00	3.23
9	What are status and trends in	3.08	3.20	3.14	dissolved oxygen	2.68	4.00	4.00	3.22

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Overall vital sign score
	pollutants (chemicals, nutrients, effluents, and trash)?								
12	What are status and trends in pollutants (e.g. ozone, N, S, particulates)?	3.17	2.66	2.91	pollutants	3.22	4.00	4.00	3.19
3	What are the status and trends in anthropogenic disturbance?	3.21	3.35	3.28	human disturbance dynamics - terrestrial	3.10	1.00	3.00	3.19
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	turbidity	2.44	4.00	4.00	3.17
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	debris or oil on seabirds (carcasses)	2.36	4.00	4.00	3.16
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	special botanical areas (e.g. Little Bald Hills, Puccinelli a springs)	2.86	3.00	3.00	3.15
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	freshwater invertebrates	2.93	3.00	3.00	3.15
11	What are the long term trends in the	3.18	2.89	3.04	vegetation dynamics	2.61	1.00	4.00	3.14

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	predominant habitat types?								
3	What are the status and trends in anthropogenic disturbance?	3.21	3.35	3.28	human disturbance dynamics -riverine	2.86	1.00	3.00	3.14
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	kelp forest	2.81	1.00	3.00	3.14
5	What are status and trends in focal species?	3.22	3.28	3.25	sensitive birds (e.g. common murre)	2.88	2.00	3.00	3.13
5	What are status and trends in focal species?	3.22	3.28	3.25	sensitive plants	2.87	2.00	3.00	3.12
3	What are the status and trends in anthropogenic disturbance?	3.21	3.35	3.28	human disturbance dynamics - subterranean	2.71	3.00	3.00	3.11
5	What are status and trends in focal species?	3.22	3.28	3.25	sensitive fish (e.g. flat fish)	2.79	2.00	3.00	3.11
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	freshwater mussels	2.73	4.00	3.00	3.10
7	What are the status and trends in natural disturbance events (e.g. fire, floods)?	3.28	3.03	3.15	riverine disturbance dynamics	3.03	1.00	3.00	3.10
7	What are the status and trends in natural	3.28	3.03	3.15	terrestrial disturbance dynamics	3.03	1.00	3.00	3.10

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	disturbance events (e.g. fire, floods)?								
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	cave species	2.61	2.00	3.00	3.10
5	What are status and trends in focal species?	3.22	3.28	3.25	sensitive mammals (e.g. pika)	2.73	2.00	3.00	3.10
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	bats	2.66	2.00	3.00	3.09
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	Chlorophyll	2.00	4.00	4.00	3.09
5	What are status and trends in focal species?	3.22	3.28	3.25	keystone marine species (e.g. bull kelp)	2.66	1.00	3.00	3.08
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	marine invertebrates	2.60	2.00	3.00	3.08
6	What are status and trends in surface waters?	3.26	3.07	3.16	ephemeral features (streams, pools, snow melt beds)	2.88	3.00	3.00	3.07
5	What are status and trends in focal species?	3.22	3.28	3.25	sensitive marine species	2.61	2.00	3.00	3.07
12	What are status and	3.17	2.66	2.91	acid depositio	2.58	4.00	4.00	3.07

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	trends in pollutants (e.g. ozone, N, S, particulates)?				n				
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	marine algae	2.53	2.00	3.00	3.06
2	What are status and trends in structure, function, and composition of focal communities?	3.44	3.14	3.29	cave entrance community	2.44	2.00	3.00	3.06
6	What are status and trends in surface waters?	3.26	3.07	3.16	springs	2.80	4.00	3.00	3.06
1	What are the trends in distribution and abundance of non-native species through time?	3.43	3.46	3.44	non-native diseases	2.94	3.00	2.00	3.05
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	water birds	1.80	2.00	4.00	3.05
18	How are snowpack dynamics changing over time?	3.03	2.31	2.67	snowpack duration	3.09	1.00	4.00	3.02
1	What are the trends in distribution and abundance of non-native	3.43	3.46	3.44	non-native invertebrates	2.71	3.00	2.00	3.01

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	species through time?								
18	How are snowpack dynamics changing over time?	3.03	2.31	2.67	snowpack spatial extent	2.94	1.00	4.00	2.99
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	cave formations	2.48	3.00	3.00	2.99
14	Are climate associated ecotones changing through time?	3.13	2.28	2.70	elevationa l vegetatio n boundarie s (e.g. treeline)	2.81	1.00	4.00	2.98
16	Have rates, extent, location, or types of erosional and depositional processes changed?	2.76	2.59	2.68	turbidity	2.85	4.00	4.00	2.98
15	What are the trends in harvesting of park resources?	2.49	2.87	2.68	commerci al fishing	2.84	3.00	4.00	2.97
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	wildlife migration	2.40	2.00	3.00	2.97
12	What are status and trends in pollutants	3.17	2.66	2.91	snowpack chemistry	2.85	4.00	3.00	2.92

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	(e.g. ozone, N, S, particulates)?								
16	Have rates, extent, location, or types of erosional and depositional processes changed?	2.76	2.59	2.68	bank erosion	2.54	1.00	4.00	2.91
17	What are the trends in diseases or parasites (including forest insects) through time?	2.92	2.42	2.67	plant mortality	2.50	1.00	4.00	2.90
3	What are the status and trends in anthropogenic disturbance?	3.21	3.35	3.28	human disturbance dynamics -marine	2.64	1.00	2.00	2.90
3	What are the status and trends in anthropogenic disturbance?	3.21	3.35	3.28	human disturbance dynamics - lacustrine	2.64	1.00	2.00	2.90
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	Bryophytes and lichens	2.64	1.00	2.00	2.89
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	insects	2.63	2.00	2.00	2.88
12	What are status and trends in pollutants (e.g. ozone, N, S, particulates)?	3.17	2.66	2.91	amphibians (tissue sampling)	2.65	3.00	3.00	2.88
22	How is woody debris production and storage changing over	2.62	2.31	2.46	riparian woody debris	3.00	1.00	4.00	2.88

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
	time?								
15	What are the trends in harvesting of park resources?	2.49	2.87	2.68	populations prone to poaching (e.g. Roosevelt elk)	2.30	3.00	4.00	2.87
12	What are status and trends in pollutants (e.g. ozone, N, S, particulates)?	3.17	2.66	2.91	lichens	2.53	3.00	3.00	2.85
22	How is woody debris production and storage changing over time?	2.62	2.31	2.46	terrestrial woody debris	2.86	1.00	4.00	2.85
5	What are status and trends in focal species?	3.22	3.28	3.25	rare birds (e.g. brown pelican)	2.48	4.00	2.00	2.85
5	What are status and trends in focal species?	3.22	3.28	3.25	rare mammals (e.g. stellar's sea lion)	2.48	4.00	2.00	2.85
5	What are status and trends in focal species?	3.22	3.28	3.25	rare fish (e.g. salmonids)	2.48	4.00	2.00	2.85
20	What is timing and duration of key climate-related phenological events?	2.95	2.05	2.50	bud break	2.69	0.00	4.00	2.84
5	What are status and trends in focal species?	3.22	3.28	3.25	rare plants	2.37	4.00	2.00	2.82
20	What is timing and duration of key climate-	2.95	2.05	2.50	flowering	2.61	1.00	4.00	2.82

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Overall vital sign score
	related phenological events?								
12	What are status and trends in pollutants (e.g. ozone, N, S, particulates)?	3.17	2.66	2.91	aquatic species composition	2.34	2.00	3.00	2.82
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	threatened and endangered species	2.61	4.00	2.00	2.81
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	water craft traffic	2.58	1.00	2.00	2.81
5	What are status and trends in focal species?	3.22	3.28	3.25	rare marine species	2.26	4.00	2.00	2.80
12	What are status and trends in pollutants (e.g. ozone, N, S, particulates)?	3.17	2.66	2.91	pollution sensitive trees	2.19	2.00	3.00	2.79
18	How are snowpack dynamics changing over time?	3.03	2.31	2.67	snowpack depth	2.91	1.00	3.00	2.78
7	What are the status and trends in natural disturbance	3.28	3.03	3.15	subterranean disturbance dynamics	2.38	3.00	2.00	2.77

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
	events (e.g. fire, floods)?								
22	How is woody debris production and storage changing over time?	2.62	2.31	2.46	intertidal woody debris (beach)	2.37	1.00	4.00	2.75
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	sea bird behavior	2.31	2.00	2.00	2.75
7	What are the status and trends in natural disturbance events (e.g. fire, floods)?	3.28	3.03	3.15	lacustrine (lake) disturbance dynamic	2.29	1.00	2.00	2.75
9	What are status and trends in pollutants (chemicals, nutrients, effluents, and trash)?	3.08	3.20	3.14	marine mammals with oil or attached debris	2.29	4.00	2.00	2.74
8	What are status and trends in human impacts near sensitive plant and animal populations and habitats?	3.03	3.28	3.15	marine mammal behavior	2.22	2.00	2.00	2.73
7	What are the status and trends in natural disturbance events (e.g. fire, floods)?	3.28	3.03	3.15	marine disturbance dynamics	2.16	1.00	2.00	2.72
16	Have rates,	2.76	2.59	2.68	gully	2.59	1.00	3.00	2.72

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	extent, location, or types of erosional and depositional processes changed?				formation				
21	How is sea level and ocean temperature changing?	3.00	2.00	2.50	Sea level (max & min tides)	3.00	1.00	3.00	2.70
14	Are climate associated ecotones changing through time?	3.13	2.28	2.70	intertidal boundaries	2.38	2.00	3.00	2.70
21	How is sea level and ocean temperature changing?	3.00	2.00	2.50	ocean temperatures	2.88	1.00	3.00	2.68
19	How is cave air flow (quantity and quality) changing through time?	2.60	2.48	2.54	air flow in caves	2.76	1.00	3.00	2.68
15	What are the trends in harvesting of park resources?	2.49	2.87	2.68	commercial gathering (e.g. edible mushrooms)	2.23	3.00	3.00	2.65
21	How is sea level and ocean temperature changing?	3.00	2.00	2.50	intertidal zonation	2.62	1.00	3.00	2.62
14	Are climate associated ecotones changing through time?	3.13	2.28	2.70	freshwater vegetation boundaries	2.00	1.00	3.00	2.62
17	What are the trends in diseases or	2.92	2.42	2.67	nest parasites (cowbirds	2.07	1.00	3.00	2.62

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	parasites (including forest insects) through time?)				
28	What are status and trends in fog?	2.61	1.77	2.19	air temperature	2.46	1.00	4.00	2.61
14	Are climate associated ecotones changing through time?	3.13	2.28	2.70	estuarine vegetation boundaries	1.93	1.00	3.00	2.61
13	What are status and trends in ground waters?	2.74	2.70	2.72	aquifers (depth, volume, variability)	2.77	2.00	2.00	2.59
13	What are status and trends in ground waters?	2.74	2.70	2.72	groundwater contaminants	2.76	4.00	2.00	2.58
26	What are status and trends in subterranean water and ice?	2.43	2.29	2.36	cave water contaminants	2.69	4.00	3.00	2.55
4	What are status and trends in focal taxa groups?	3.38	3.15	3.26	mycorrhizae	1.92	2.00	1.00	2.54
13	What are status and trends in ground waters?	2.74	2.70	2.72	groundwater chemistry	2.52	4.00	2.00	2.54
26	What are status and trends in subterranean water and ice?	2.43	2.29	2.36	cave water chemistry	2.59	4.00	3.00	2.53
29	What are status and trends in visibility?	1.89	2.16	2.03	visibility	2.58	4.00	4.00	2.53
26	What are status and trends in subterranean	2.43	2.29	2.36	cave water temperature	2.56	4.00	3.00	2.53

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Overall vital sign score
	water and ice?								
26	What are status and trends in subterranean water and ice?	2.43	2.29	2.36	cave water flow	2.50	1.00	3.00	2.52
13	What are status and trends in ground waters?	2.74	2.70	2.72	hyporheic zones	2.41	1.00	2.00	2.51
26	What are status and trends in subterranean water and ice?	2.43	2.29	2.36	cave ice dynamics	2.47	3.00	3.00	2.51
24	How are ocean and nearshore processes changing through time?	2.77	2.00	2.38	Sea level (max & min tides)	2.22	1.00	3.00	2.47
17	What are the trends in diseases or parasites (including forest insects) through time?	2.92	2.42	2.67	diseased marine invertebrates	2.26	2.00	2.00	2.45
16	Have rates, extent, location, or types of erosional and depositional processes changed?	2.76	2.59	2.68	sheet erosion	2.19	1.00	2.00	2.44
19	How is cave air flow (quantity and quality) changing through time?	2.60	2.48	2.54	cave species composition	2.53	2.00	2.00	2.43
15	What are the trends in harvesting of park resources?	2.49	2.87	2.68	commercial hunting	2.10	3.00	2.00	2.43
20	What is	2.95	2.05	2.50	bird	2.63	1.00	2.00	2.43

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Overall vital sign score
	timing and duration of key climate-related phenological events?				breeding				
24	How are ocean and nearshore processes changing through time?	2.77	2.00	2.38	waves	1.95	0.00	3.00	2.42
20	What is timing and duration of key climate-related phenological events?	2.95	2.05	2.50	invertebrate hatching	2.50	1.00	2.00	2.40
23	What are status and trends in soils?	2.65	2.20	2.42	soil carbon	2.67	1.00	2.00	2.39
19	How is cave air flow (quantity and quality) changing through time?	2.60	2.48	2.54	mineral dissolution and accretion	2.28	2.00	2.00	2.38
17	What are the trends in diseases or parasites (including forest insects) through time?	2.92	2.42	2.67	animal carcasses	1.87	0.00	2.00	2.38
17	What are the trends in diseases or parasites (including forest insects) through time?	2.92	2.42	2.67	marine mammal behavior	1.83	1.00	2.00	2.37
23	What are status and trends in soils?	2.65	2.20	2.42	soil compaction	2.52	1.00	2.00	2.36
28	What are status and	2.61	1.77	2.19	Redwood growth	2.21	3.00	3.00	2.36

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
	trends in fog?				and metabolism				
27	What are the status and trends of biotoxin accumulation?	2.57	2.10	2.34	biotoxin accumulation in predators	2.77	1.00	2.00	2.35
28	What are status and trends in fog?	2.61	1.77	2.19	ocean temperatures	2.16	4.00	3.00	2.35
23	What are status and trends in soils?	2.65	2.20	2.42	soil fertility	2.36	1.00	2.00	2.33
23	What are status and trends in soils?	2.65	2.20	2.42	topsoil integrity	2.30	1.00	2.00	2.31
24	How are ocean and nearshore processes changing through time?	2.77	2.00	2.38	coastal morphology changes	2.42	1.00	2.00	2.31
25	What are the trends in pollinators?	2.75	2.00	2.38	pollinator composition	2.41	2.00	2.00	2.31
25	What are the trends in pollinators?	2.75	2.00	2.38	pollinator abundance	2.36	2.00	2.00	2.30
26	What are status and trends in subterranean water and ice?	2.43	2.29	2.36	cave aquatic species composition	2.33	2.00	2.00	2.28
29	What are status and trends in visibility?	1.89	2.16	2.03	light at night	2.26	1.00	3.00	2.27
23	What are status and trends in soils?	2.65	2.20	2.42	sheet erosion	1.87	1.00	2.00	2.23
28	What are status and trends in fog?	2.61	1.77	2.19	fog dynamics and distribution	2.48	1.00	2.00	2.21

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
23	What are status and trends in soils?	2.65	2.20	2.42	soil biota	2.57	1.00	1.00	2.17
30	What are changes in extent of soil crust?	2.19	1.84	2.02	biological soil crust extent	2.70	1.00	2.00	2.15
31	What are the status and trends in subterranean geologic processes?	1.95	1.80	1.88	seismic activity	2.07	1.00	3.00	2.14
33	What is the effusion rate of geothermal groundwater into the surface environment?	1.55	1.32	1.43	geothermal groundwater temperature	2.13	3.00	4.00	2.09
24	How are ocean and nearshore processes changing through time?	2.77	2.00	2.38	nearshore currents	2.09	1.00	1.00	2.05
31	What are the status and trends in subterranean geologic processes?	1.95	1.80	1.88	sediment movement	2.57	1.00	2.00	2.04
31	What are the status and trends in subterranean geologic processes?	1.95	1.80	1.88	mineral dissolution and accretion	2.43	3.00	2.00	2.01
33	What is the effusion rate of geothermal groundwater into the surface environment?	1.55	1.32	1.43	geothermal groundwater chemistry	1.75	3.00	4.00	2.01
32	What are the status and trends in	2.00	1.54	1.77	coastal morphology	2.45	1.00	2.00	1.95

Rank of question	Monitoring question	Avg. of ecol. sig.	Avg. of man. sig.	Avg of ecol. and man. sig.	Vital sign	Relevancy score	Legal mandate score	Feasibility cost score	Over all vital sign score
	marine geologic processes?				changes				
33	What is the effusion rate of geothermal groundwater into the surface environment?	1.55	1.32	1.43	geothermal groundwater flow	2.38	3.00	3.00	1.93
31	What are the status and trends in subterranean geologic processes?	1.95	1.80	1.88	cave wall fracture and collapse	2.00	3.00	1.00	1.73
31	What are the status and trends in subterranean geologic processes?	1.95	1.80	1.88	weathering	2.00	1.00	1.00	1.73
32	What are the status and trends in marine geologic processes?	2.00	1.54	1.77	sediment dynamics	2.16	1.00	1.00	1.69